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NOTES ON MIRANDA AURANTIA.

BY F. WENNINGER.

Miranda Aurantia is the large, yellow garden spider, common in summer and early autumn. The specimens that furnished the matter for the observations recorded in this paper were collected during the summer and early autumn of 1916 and 1917. In August and September, 1916, the species was found in greatest abundance along the shores of the St. Joseph River in the triangle formed by the river, St. Mary's road and the Michigan Central tracks. The ground around the two lakes at Notre Dame was explored with this result; the species was found quite abundant along the north shore of St. Mary's Lake, there were comparatively few spiders of this species along the south shore, and only an occasional specimen along St. Joseph's lake. An hour's collecting along the St. Joseph River in August, 1916, yielded about two hundred and sixty specimens, suitable for laboratory purposes. During the corresponding season of this year, 1917, a marked decrease was noticeable in the number of desirable specimens along the River, though the number of spiders around the lakes near the University appeared to be about normal. This year, what seems to be a new and isolated colony was found on a plot of ground adjoining the University athletic field, a distance of, perhaps, four hundred yards from the nearest lake. Some of the largest spiders had built their webs and nests here, near *Agelena nevia* and some species of *Epeiridae* and *Theridiidae*. One should expect to find the species distributed rather generally along the fields connecting this outpost with the central colony along the lakes. But the fact did not warrant this expectation.

Miranda Aurantia has been known to science since 1833. The following table, taken from Nathan Banks,[1] gives a fairly

[1]Nathan Banks in U. S. Museum Bulletin, Vol. 72, p. 46.

complete list of the names under which the species has been described:

Argiope Aurantia, Lucas, 1833.
Argiope vestita, Koch, 1839
Argiope riparia, Hentz, 1847
Argiope riparia, Emerton, Conn. Acad. 1884.
Argiope sutrix, Hentz 1847
Argiope multiconcha, Treat, Am. Nat, 87. p. 1122.
Argiope Cophinaria, McCook, Am. spiders, '94, p. 217.
Argiope personata, Cambridge, Biol. Cent. Am. Arach., 1, p. 10, '90.
Argiope Godmani, Cambridge, Biol. Cent. A,. Arach., 1, p. 336, '98.
Miranda Aurantia, Comstock, Spider Book, p. 434, 1912.

The question of priority of nomenclature has not received much attention. Authors that mention the species seem to fix on the name that they consider correct and use it without, in most instances, a reference to other names. The species has been known most commonly under the name, *Epeira riparia*, given to it by Hentz in 1847, and under the name *Epeira cophinaria*, given to it by Walckenaer in 1837. But as early as 1830, Lucas had described and figured the species as *Aurantia*. This name, therefore, has the claim of priority. As to the generic name, this is to be said: *Argiope* is undoubtedly the older name, but, for many reasons, the best of which is to be found in a very desirable rearrangement of all allied genera, F. O. Pickard-Cambridge in the Biologia Central Am., separated the genus *Miranda* from the genus *Argiope*. The best modern scholarship, therefore, seems to indicate that the name *Miranda Aurantia* is to be preferred.

The average adult female of the species has all the general characteristics of the order *Araneida*. The cephalothorax is nearly as wide as long, and is covered with silvery white hairs except around the eyes. The abdomen is oval, a little pointed behind and square in front, with two small humps at the corners. The ground color is black marked with bright yellow or orange spots. On each lateral margin of the abdomen, the yellow spots form an almost continuous band. There is a black band between these two rows of spots, and in this there are from one to three pairs of yellow spots. In most of the specimens examined by the writer, two pairs of spots were found. The color of the ventral side is black, with a yellow stripe on the sternum, and two rather wide yellow stripes on the abdomen with small yellow spots between and at the sides.

The male differs considerably from the female. It is much

smaller, being only about one fourth as long as the female. There is a pair of palpi that attract attention on account of their size. The abdomen has a broad band of brown along the middle of the back, and on each side there is a band of white.

The body of the young spiderlings, is quite slender, and, while still in the egg-sac, shows hardly any differentiation of color. But soon after they emerge they begin to show color characteristics. The ground-color is pale brown or black and the markings are gray instead of the strong yellow and black of the adult. The legs are marked at the ends and in the middle of each joint with dark rings.

The anatomy of the species, both external and internal, is that common to all true spiders. These notes, therefore, will indicate only those structures wherein *Aurantia* differs from the type.

The term "areas" of the head" is used by some authors. But since there are no sutures to limit spaces, this terminology seems to have only a questionable practical value.

The "eye-space"—that area of the head bounded by a line drawn around the eyes—is quite small in this species. In form, it might be described as trapeziform.

The eyes of this spider are all simple. They are eight in number, and there are no facets. They are the so-called diurnal eyes; nocturnal eyes are lacking. In arrangement, they are so separated as to occupy nearly the whole width of the head.

The eyes are not elevated and, hence, the "ocular tubercle" is absent.

The chelicerae are short and stout, and consist of a basal segment and a terminal claw. The lateral condyles seem to be wanting. There is, however, a furrow in the basal segment, armed with a row of teeth.

The next departure from the anatomy of the type occurs in the legs. The usual seven parts are present and are easily distinguishable,—coxa, trochanter, femur, patella, tibia, metatarsus and tarsus. The claws are outgrowths from the terminal portion of the leg, called the pretarsus. They are composed of many hypodermal cells. In *M. Aurantia*, the pretarsus seems to be a distinct segment. There are three claws on each tarsus. Two of these claws are placed side by side on the upper surface of the pretarsus, while the third is below; the whole arrangement is triangular in form. The upper, or paired claws, have a series of teeth. The third claw

is just perceptibly smaller than the other two, and has also a number of teeth; but these are finer and fewer than in the other claws. In addition to these claws there are also six accessory claws.

The tip of the tarsus is usually armed with terminal tenant hairs. These seem to be entirely wanting in the species for of all the specimens examined by the writer, only one specimen showed structures approximating this even remotely.

The calamistrum is the hackle for the formation of the "hackle band" characteristic of the web of this spider. It is composed of several rows of curved spines on the upper margin of the metatarsus of the hind legs.

In the abdominal region, the following peculiarities are to be noted: there is no *pedical* and no *folium* in the species. Muscle impressions—small, hardened points indicating the place of attachment of the muscles to the body wall—are present in *M. Aurantia*. The dorsal surface seems to bear two pairs of muscle impressions, while an unpaired one appears near the base of the abdomen.

There are two kinds of spiracles in *M. Aurantia*. One kind is the lung-slits; and there is at least one pair of these. The other spiracles are the tracheal spiracles, situated in front of the spinnerets. Of these there is only one.

The *epigynum* of *M. Aurantia* is a complicated organ. The chitinous plate is depressed and furrowed longitudinally, and the depressed area is divided by a ridge-like elevation which marks the depression off into two furrows or channels, each leading into an opening of the spermatheca of the corresponding side.

There are four spinnerets having two segments each, and one, the hind spinneret, having four segments. The sides of these organs are firm, but the terminal portion, constituting the spinning field, is membraneous. This latter portion is surrounded by two kinds of hairs, simple and barbed. The number of spinning tubes is very great—a hundred on each spinneret would probably be a conservative estimate. *Aurantia* spins silk of three colors. White silk forms the web, the bands for securing captured prey, and the egg-cocoon; brown silk forms the interior of the egg-sac; yellow silk forms a kind of buffer between the eggs and the outside covering. The glands that secrete this silk are numerous and of several kinds. The most numerous are the aciniform or berry-shaped glands. Comstock has determined by experiment that the function of these glands is the manufacture of the silk for the swathing band. The

pyriform or pear-shaped glands are present in large numbers. Their function is the production of silk for the attachment disks. The *ampullae* glands produce the silk for the formation of "drag-lines" in the net. These are not numerous. *Cylindical* glands are present in small numbers. They produce the silk from which the egg-bag is made. There are two poison glands that discharge their contents through a long slender duct that opens near the tip of the claw of the chelicera. Glands that are lacking in *Aurantia* are: aggregate, lobed and cribellum glands.

The eggs of *M. Aurantia* are laid in a mass protected by two layers of silk and enveloped in a waterproof bag. Most of these egg-sacs are attached to thistles or milkweed or golden rod. But many were found attached to such objects as cast-off window screens, pieces of timber projecting from lumber piles, discarded fence-posts, and some were fastened under the eaves of an old barn. The egg-sac is about the size of a hickory nut—the average diameter of observed specimens was about 22mm. The size was constant in a very large majority of cases. But some egg-sacs measured 30 mm. and a few only 15, or even 12 mm. in diameter. The average egg-sac contains about a thousand eggs. But some have only a little more than five hundred, and a few were found that contained about eight hundred. The reason for this is not clear from observation, and there is none given in the literature of the subject as far as it has come under my notice. A difference of twenty or fifty could easily be traced to individual peculiarities. But a difference ranging from two to five hundred in the same species seems to need a more substantial explanation than individual peculiarity or fertility.

The eggs hatch in a short time—about two weeks for specimens observed in this locality. But the spiderlings remain in the egg-sac until the following spring. While still enclosed in the sac, they develop those canabalistic tendencies that are remarkable in the adult. An egg-sac of this species opened on September 17, 1916, contained 1018 live spiderlings, and about 200 remains of their weaker companions that had succumbed to the canabalism of the stronger spiders.

It is certain that *M. Aurantia* sheds its outer layer of the cuticula. I have found the molts from time to time, but have been unable to determine thus far, how often this happens. Exact observations on this point do not seem to have been made, or if

made, have not been recorded in the literature on the subject to which I have had access.

The food of *M. Aurantia* consists chiefly of insects. But spiders will eat other spiders, and, after the pairing season, the female usually devours the male. In September, 1917, a male and female were brought to the writer's laboratory. The collector had put them into a pill box. When the box was opened, the male was found tightly wrapped in his shroud, and the female had already begun her meal. The staple article of food of *M. Aurantia* seems to be grasshoppers. These are swathed in a wide band of silk and then rendered palatable by the injection of some venom through a bite with the spider's chelicerae. Other insects of many species are devoured with avidity, even such large species as dragon flies and butterflies. The following is a list of insect remains found in the webs of this species during the months of August and September, 1916 and 1917: *Libellula basalis, Libellula pulchella, Argia violacea, Annosia plexippus, Helophilus latifrons, Euschistus variolarius, Sympetrum rubicundum, Mesothemis simplicicollis,* katydids and weevils.

The process of swathing a captured insect is interesting. To observe this at close range, one has but to introduce a grasshopper into the web of a mature female. The spider will rush at the grasshopper, pierce it with the chelicerae and then dart off to safety. After a brief wait, the spider will approach the insect and, pulling out a sheet of silk from its spinnerets, with one hind leg, thrust the sheet against the grasshopper. In doing this, the spider uses first one hind leg and then the other, whirling the grasshopper around rapidly. The captive is thus securely wrapped in a tight band of silk composed of many parallel threads, and is immediately devoured or left for a more opportune time.

The task of spinning the web is begun by throwing out a thread which is carried by the air till it strikes some object and adheres to it. This line is now pulled tight and forms a kind of bridge over which the spider may travel. Foundation lines are now thrown out and these are connected by radii. The center where these radii converge is strengthened by a mesh or net-work of lines, called a hub. A characteristic structure of the web of *Aurantia* is the stabilimentum. This is a zig-zag ribbon across the center, or below the hub. It consists of a large number of minute threads

resembling the swathing band, and is doubtless spun from the small spinning tubes.

The silk of this spider, as also the structure of its web, can be studied conveniently by taking a large pane of glass and passing it behind the web. By moving the glass forward and snipping off the threads with scissors, the web is transferred to the glass. This makes a suitable mount for the naked eye and microscopic study.

A word should be said about the venom of spiders. All spiders secrete poison, but only very few spiders are dangerous. I have collected hundreds of specimens of spiders, but have never been bitten. In fact, no spider even attempted to inject its venom. It is the opinion of such authorities as Comstock that in the North there is no spider to be feared while in the South there is a single easily recognized species "that is believed by some people to be dangerous." Certainly no one can justify his antipathy to the study of araneology on the ground that spiders are venomous and dangerous.

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NEW FORMS OF CALAMITES

BY N. M. GRIER

The specimens upon which this work is based were collected by Mr. Caspar Reel and myself at Reel's Stone Quarry, East Bellevue, Pa., from the sandstone above the Elk Lick Coal. They were exhibited and discussed before the Academy of Science of St. Louis, Jan. 11, 1915, and are deposited in the collection of the Academy.

EUCALAMITES.

Group of *Calamites cruciatus* Sternb.

Calamites cruciatus harrisoni, n. sp.

Pl. I., figs. 1. 2.

Internodes 23-28 mm. in length, broader than long. Articulations well marked by nodal swellings. Ribs well defined, 2-3 to 3-4 mm. in breadth, equal, half round, not alternating and generally somewhat inflated at the articulations. Furrows generally 1-3 the width of the ribs. Branch scars at least 7 to the node, 8-9 mm. in diameter, showing

the central insertion point, 15 mm. apart on the nodal line, alternating on the neighboring nodes, with 12-16 ribs converging on each side to them. Leaf scars, if any, indistinct.

The type specimen, consisting of a cast of the medullary cavity, has been subjected to flattening influences, resulting in a splitting of the stem length-wise. It is composed of 3 nodes in a fair state of preservation, the upper two 28 mm. in length while the lower is 23 mm., their circumferences being 13, 12 1-2, and 12 cm. respectively. A portion of it is covered with a thick and somewhat coaly bark of about 4 mm. thickness at some places, and upon which the furrows appear but indistinctly. The combined thickness of the bark and medullary cavity is from 80-83 mm. at the upper (?) end, while the lower (?) end has a diameter of 41 mm.

Following the nomenclature as proposed by Jongmans[1], this specimen evidently is a member of the *cruciatus* group. With 7 branch scars it would tend to approximate the *Calamites cruciatus septenarius* of Sterzel. The following distinguishing features appear. Of the two more clearly distinguished varieties of this latter form, the variety *fascialus* of Sterzel is excluded by the shortness of its joints, the presence of leaf traces, and the minimum number of ribs converging to form the branch scars.

The rather incompletely described variety *Brongniarti* of Sternburg is eliminated through the possession of leaf scars, absence of swellings at the nodes, and the want of distinct impressions of the ribs.

In short, the number of estimated branch scars, the number of ribs converging to meet these, their width and distance from one another, considered with the length, diameter and circumference of the joints widely separate this form from any hitherto described as belonging to this group, making it clear that we are dealing with a new species which I have dedicated to Prof. R. G. Harrison of Yale University, an inspiring worker in taxonomic fields.

Calamites multifoliatus n. sp.

Pl. II., figs. 1. 2

Internodes 36-38 cm. in length, broader than long. Articulations somewhat constricted, increasing in size from the base (?) of the stem. Ribs at least 4 times the width of the furrows, well defined, half-round, pointed at the ends, terminating in leaf scars at the nodes, or converging in group of 2-4 to the nodal line. Apparently two branch scars to the

whorl, opposite in position, to which 8-12 ribs converge. Numerous leaves.

The type specimen, a cast of the medullary cavity consists of one almost perfect node, and well preserved portions of two others. While also subjected to a flattening process, it has not split. The one measurable node has a diameter of 16 1-2 cm. A break in the wall of the cast shows the imprint of the cavity wall on the core-like matrix.

It became clear that of all previous species described, the specimen resembled most closely the *Calamites ramosus* of Artis. Of the three figures of this species given by Jongmans, those from Artis and Stamm bear hardly a superficial resemblance, while that of Weiss, although approximating, gives indications of somewhat different characters.

The internodes of the older part of the stem are not slender, and are hardly longer than wide. The ribs so far as this particular specimen is concerned, are devoid of tubercles, they are not bluntly pointed as in *ramosus*, and average 1 1-3 mm. in width, the furrows 1-3 mm. They apparently never alternate, and continue from node to node, a character not to be observed in the figure of Weiss. No trace of any microscopical striation is to be found here, and the average number of ribs to the cm. is only about 1-3 as great. There is no well defined "corona" surrounding the insertion point of the branch scar, and these are much smaller. It will be observed that the stem (?) begins in a fashion never found in *ramosus* according to Weiss and Zeiller, and resembling that found in *Suckowi*. Still another distinguishing point is the comparatively small number of ribs taking part in the formation of each branch scar.

Calamites Fettermanni n. sp.

Pl. III., figs. 1. 2.

Stem only moderately slender, articulations well set off by nodal swellings. Joints at least 3 times as long as wide. Ribs pointed, 2 mm. in breadth, not alternating, distinct, flat or rounded, longitudinally striated, when flattened giving the furrows a doubly striated appearance. Furrows 1-3 to 1-2 mm. in breadth. Tubercles present but mostly indistinct. Branch scars alternating probably 6 to the whorl, insertion points 2-3 mm. in width. Leaves apparently absent.

[1]Jongmans W. J., "Anleitung zur Bestimmung der Karbon pflanzen West Europas." Bd. I (1913), from whose descriptions also, the greater part of the comparisons have been made.

The type, a cast of the medullary cavity, has become broken into 3 pieces, which when joined give evidence of this species striking peculiarity the great length of the internodes. The ribs, in greater number run straight into the branch scar, with apparently no great tendency to converge. No trace of a bark is present. This form is respectfully dedicated to J. C. Pettermann, Professor of Biology, University of Pittsburgh.

Pl. I.

Fig. 1. Calamites cruciatus Harrisoni, n. sp. x 1.
Fig. 2. The same, a branch scar x 2 1-2

Pl. II.

Fig. 1. Calamites multifoliatus n. sp. x 1.
Fig. 2. The same, x 2 leaves and ribs slightly magnified to show their arrangement.

Pl. III.

Fig. 1. Calamites Fettermanni n. sp. x 7-11
Fig. 2. The same, a branch scar x 3

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OUR WINTER BIRDS.

BY BROTHER ALPHONSUS, C. S. C.

(CONCLUSION.)

RED-HEADED WOODPECKER

Melanerpes erythrocephalus

This woodpecker is not a regular winter species, and was found by the writer for two seasons—1913–1914 and 1914–1915—in twelve years of observation. Manuals of ornithology state that the abundance of food suitable for this species will cause it to stay during the winter. But if that be true, why was this food not found but twice in twelve winters, although these were both consecutive seasons? I cannot believe that such was the case, and therefore I do not think that the problem of the birds' presence can be solved by the food question. Of course the species was not present in large numbers, never more than a few individuals were seen; and this fact might point to a solution of the problem. Individuals of other species; such as, the Meadowlark, Robin, Bronzed Grackle, may be seen by careful observers in winter; and if this is so, why

would not the presence of the Red-headed Woodpecker for two winters be due to the same peculiar causes as lead these other species to stay in small numbers?

Snowbird
Junco hyemalis

A comparison of two sets of years, each containing four years, shows much irregularity for the Snowbird. During the first period the total number of records was 60, and for the four last years there were 137 records. Here is something rather hard to explain. Why should there be such a notable difference in the number of records of a common species in the two sets of years? It cannot be that the four first seasons were more severe and the snow more deep. I am inclined to believe that a number of winter species go farther south than our latitude, perhaps very few individuals remaining with us during the severest part of the winter. And when any species is present only in small numbers, it may not be found over a large area. These facts may account for the scarcity of the snowbird during parts of some winters. However, there may be other causes, more or less inexplicable, but none the less certain, that, if known, would account for the irregularity and scarcity of this and other winter species.

Downy Woodpecker
Dryobates pubescens medianus

Some interesting figures were obtained for this species in eight winters. The four first show as the total number of records—47, with an average each winter of about 11 records; the four last have a total of 99 records, and an average yearly record of about 24. I could not begin to account for such great disparity in distribution as is disclosed by these figures. Were the weather conditions so different in both sets of years as to cause this notable difference? As already stated in regard to other species, I think not. Neither was it a food question. What then are the possible determining factors in the distribution of the Downy Woodpecker? Well, I have observed that at other seasons of the year this species may often be long absent—why, I cannot say. But this is a fact, and such a thing may occur in winter as well as in spring, let us say. My opinion, then, is that migration is one of the principal factors in the small distribution of this species at certain seasons of the year, winter among them.

Tree Sparrow
Spizella monticola

The study of this, the commonest of our winter sparrows, has been very interesting to me. In four winters I made but 28 records for the species; in four other winters I made 87 records. These observations suggest a number of interesting questions. First, what was the porbable cause of the great difference in distribution between the two sets of years? I think the Tree Sparrow can never be found in abundance during winter, but is always present in a few small flocks. Second, I am disposed to believe that the species shuns places where snow is deep, and will therefore be absent from such localities for long periods of time. I admit, however, that such reasons as these do not fully account for the disparity noted above. To my mind the movements of birds in winter are more or less involved in mystery. How true it is that science may observe and name, but many things it can never explain. But this mysterious element is a lure always beckoning the student to make more ardent efforts to grasp the coveted knowledge.

Chickadee
Penthestes atricapillus

A very curious instance of irregularity and scarcity is found in the Chickadee. In four winters, 1909–1910 to 1912–1913, I made but five records for this species; and from 1913-1914 to 1916–1917, there were 107 records in winter. Here is certainly an enigma. Not only was great disparity noted between the two sets of years, but between two seasons of the second set there was the same. Did the Chickadee change its habits towards the end of my observations? Compare five records with 107, and try to explain the disparity on any other supposition. In spring and summer this species is absent almost continuously, returning to the deep woods for nesting. Here it may be found by any observer who goes to such a place. This is clear enough; but to explain the irregularity of the species in the various winters it was under my observation, this I cannot do.

Snowflake
Plectrophenad nivalis

The records obtained in eight winters for the Snowflake are interesting. For three winters the species was not found. In 1913–

14 there were ten records, more than in all the other winters put together. From these figures we may see that the Snowflake is very irregular and unsually very rare. Just why this should be I am at a loss to know, for Notre Dame lies within a snow-belt about forty miles wide. One would expect a snow-loving species to be more regular in its appearance in such a place.

Goldfinch
Astragalinus tristis

As a winter species the Goldfinch is usually rare, if not very rare. Of the eight winters under consideration, there were five whose total number of records for this species was but five. The other three winters totalled 26 records, which shows that the Goldfinch was always rare. The birds travel in small flocks in winter, and unless the observer finds their feeding or drinking places, he may seldom see them.

Brown Creeper
Certhia familiaris americana

Comparing the two sets of years, I find that in the first there were 13 winter records for the Brown Creeper, and in the second 74 records. At first sight it would seem incredible that such disparity in distrubution could be shown for a species that is usually rare in winter. But the records obtained are conclusive that the difference was real. To account for a notable increase in at least one season, 1914–15, by the fact that this winter was very mild, seems satisfactory enough. On the other hand, the very small number of records, 13, made in the four first seasons cannot be attributed to the greater severity of those winters; there ought at least to be an average number for each year that would not greatly exceed the average of each of the other four years. Even by eliminating the largest record, 40, in 1914–15, this mean yearly average cannot be shown. From these facts we must conclude that the Brown Creeper is one of the most irregular winter species.

Song Sparrow
Melospiza melodia

The records for the Song Sparrow in eight winters show only two for the four winters, 1909–10 to 1912–13, and 45 records for the four succeeding winters. Of course it were worthless to make any comparison between these figures, and the only obvious thing

to say is, either the writer failed to obtain the actual records for the first set of years, or the Song Sparrow has established itself, in recent years, as a fairly common winter species.

The winter habitat of the Song Sparrow is in the shrubbery along the shores of small lakes, or in low, waste land. Secreted in such places, the birds seldom show themselves, and usually the observer hears them before he sees them. It is difficult under such condition to know how plentiful the species is during winter. From appearances it looks as if a few individuals only remain throughout this season.

Bronzed Grackle
Quiscalus quiscula aeneus

The Bronzed Grackle had no winter records from 1909 to 1912; and for three other winters there was a total of 23 records, the species not appearing in the winter of 1914–15. The non-appearance of the Bronzed Grackle for four winters, and then its appearance for three winters, presents a curious case of irregularity of distribution. Only one bird was ever seen at any time, and this fact may go far toward explaining the absence of the species for five winters out of eight. Why this individual remained in winter is another cruious occurrence that would be difficult to explain.

Meadowlark
Sturnella magna

In eight winters the Meadowlark had but three records. Usually one and sometimes two individuals were seen. The presence of these birds seemed to indicate that they were wintering somewhere in our vicinity, but must have been little given to leaving their habitat. Another thing that strengthens this belief is that the Meadowlark was seen in every month in winter.

Sparrow Hawk
Falco sparverius

In eight winters the Sparrow Hawk was found at least once in each month, a fact that shows this is a true winter species. This being so, it is difficult to tell why there have been only four records in eight winters. Of course, like all the other hawks, this species wanders about much more in winter than at other seasons of the year. This habit may in fact account for the scarcity of the Sparrow Hawk. I think also that places that are farther out in the

country are likely to be better feeding grounds for this small hawk.

Screech Owl
Otus asio

There was a total of 14 records for the Screech Owl in eight winters, and seven records for each division of four years. The probability is that these figures do not show the actual distribution of the species; for the Screech Owl, besides being nocturnal in its activities, does not often utter its note in winter.

Cardinal
Cardinalis virginianus

The Cardinal was recorded seven times in three winters, and not found in five other winters. Always very locally distributed, this species is more difficult to see in winter than at any other season of the year; for then the bird is seldom heard to whistle, and it does not venture far from its feeding grounds.

Hairy Woodpecker
Dryobates villosus

The Hairy Woodpecker is one of our rarest winter species—five records in eight years. Out of these eight years, the species did not appear for five winters. The individuals that were seen must have wandered away from their usual habitat, the deep woods. The note of this species, which is louder and sharper than that of the Downy Woodpecker, easily distinguishes it from the smaller species. The whirring sound made by the wings is another way of recognizing this woodpecker.

Evening Grosbeak
Hesperiphona vespertina

This species was recorded only in one winter, 1910–11. There were two records in December and one in January. A small flock was seen each time, and the birds were feeding on the seeds of box-elder trees. I have not heard of any one observing this Grosbeak since the winter of 1910–11 in our vicinity. If any of my readers should know that records have been made of the Evening Grosbeak in northern Indiana, within the last seven years, I should be grateful to hear about them.

TERATOLOGICAL NOTES.

BY J. A. NIEUWLAND.

TOXICODENDRON

The leaves of *Toxicodendron vulgare* Miller, also *Toxicodendron radicans* (Linn) Kuntze are ordinarily pinnately trifoliate. Leaves with five leaflets are, however, not uncommon. These are of two rather distinct types, and intermediate forms between ternate and quinate in all stages from the simple leaflets to deeply lobed cleft and divided are even more common.

The first kind of quinate leaf is that in which the two basal leaflets of the ternate have each apparently given rise by cleavage to another smaller one. The whole has in this case a more decidedly palmate appearance as the petiolules of the outer smaller leaflets come from the same point on the rachis as the larger ones from which they are supposed to have arisen by division. The other example shows two leaflets apparently cut off from the lateral basal lobes of the terminal leaflet. In this way a rather pinnate aspect results, as the two original basal leaflets are inserted at some distance below that of the other three.

On the supposition, if it can be maintained, that teratological forms may illustrate a reversion of form to an original ancestral common to several present-day types, it may be inferred that the real poison ivy plants show a close relationship to the typically pinnate leaved *Toxicodendron Vernix* (Linn) Kuntze or Poison Sumac, by postulating a common ancestor for both. The abnormal leaves of the poison ivies referred to above resemble somewhat the more simple ones of *T. Vernix* in appearance. Quinate leaves of *T. Vulgare* and *T. radicans* are quite common at Notre Dame. A considerable number of specimens with intermediate forms was collected at Grand Beach, Mich., in the Dune region of Northern Indiana and Southwestern Michigan during the season of 1917.

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Fig. 1.

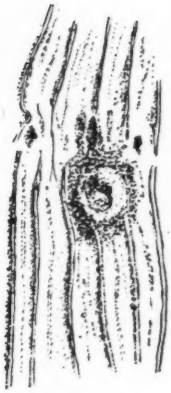

Fig. 2.

PLATE III. GRIER ON NEW FORMS OF CALAMITES